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Invited Feature

Fires in wilderness in the national parks

By Jan W. van Wagtendonk

Abstract: Historically, the only fire policy practiced by federal land management agencies was suppression, a policy that remained in place until the National Park Service officially recognized fire as a natural process in the late 1960s. The policy change allowed lightning fires ignited in specially designated management zones of some parks to run their course under prescribed conditions. The programs grew slowly as managers became comfortable with allowing fires to burn under controlled conditions, predominantly in wilderness areas. Events such as the Yellowstone fires in 1988 and the Cerro Grande Fire in 2000 resulted in reviews and updates of federal fire management policies that changed the Service's policies. Today, wilderness fire management is a vital component of the fire and fuels programs of many units of the National Park Service. Because of increasing budget and smoke management constraints, the future of restoring and maintaining fire-prone ecosystems will need to rely increasingly on the use of fire in wilderness.

Key Words: fire management, natural fire, prescribed fire, wilderness, wildland fire

Introduction

Note: This article was adapted from one previously published: van Wagtendonk, J. W. 2008. The history and evolution of wildland fire use. *Fire Ecology* 3(2):3–17.

Fire has been a dynamic ecological force in fire-prone ecosystems for millennia. As a natural process, fire is an integral part of the structure and function of park and wilderness ecosystems. The 1916 National Park Service Organic Act states that parks will be left unimpaired for the enjoyment of future generations, and the 1964 Wilderness Act states that wilderness will be protected and managed so as to preserve its natural conditions. Implicit in these statements is that fire should play

out its natural role: humans should minimize their intervention in ecological processes so that landscapes continue to be shaped by natural forces.

Not until humans felt the need to control or use fire was its role altered in natural ecosystems. Native Americans were the first humans in North America to influence fire regimes by setting fires to drive game and thwart enemies, by using fire to enhance the production of food items and basketry materials, and by controlling fires near their villages. When Europeans arrived in North America, they caused more extensive changes to fire regimes by converting forests and grasslands to farms, by indiscriminate burning, and by trying to extinguish human-caused and lightning-caused fires near settlements whenever possible. Some European settlers also used forms of prescribed fire to clear lands and open up understory vegetation for a variety of purposes. Systematic federal wildland fire management did not occur until the late 1800s, when federal land was set aside as parks and forest reserves [table 1](#). The 1910 fires in northern Idaho represented a turning point in the transition to coordinated federal suppression response and attendant policies and budgets.

Fire protection years, 1886–1967

Yellowstone National Park (Wyoming, Montana, and Idaho) was established in 1872 as the world's first national park. For the next several years, administration of the park languished until the U.S. Army was assigned the responsibility for its protection in 1886. Upon its arrival in the park, the Army found numerous fires burning in developed areas as well as in areas where it was not reasonable to control them. The Army did not have enough personnel to fight all the fires, and thus came the first decision by a manager of federal land to allow some fires to burn and to control others. The decision was pragmatic, based on availability of firefighting resources rather than recognition of beneficial effects. This policy of fire suppression was similarly applied to Sequoia, General Grant, and Yosemite National Parks (California) when they were established in 1890, and regular patrols were initiated to guard against fires. The National Park Service was established in 1916 and took over management from the Army, yet fire suppression remained the official policy in the national parks for the next five decades.

In 1962 the Secretary of the Interior asked a committee to look into wildlife management problems in the national parks. This committee, named after its chair, Dr. Starker Leopold, son of Aldo Leopold, did not confine its report to wildlife, but took the broader view that parks should be managed as holistic systems (Leopold et al. 1963). The committee recognized fire as a critical process in many natural ecosystems and pointed out the negative effects in some ecosystems as a result of a fire policy totally dominated by fire suppression. During the same period, the 1964 Wilderness Act was passed, which firmly established the protection and preservation of natural conditions in wilderness areas.

Experimental years, 1968–1977

As a result of the Leopold report and the Wilderness Act, the National Park Service changed its policy in 1968 to recognize fire as an ecological and necessary process. Sequoia and Kings Canyon National Parks, California, established a natural fire management zone in 1968 immediately after the policy changed (Kilgore and Briggs 1972; Parsons et al. 1986) and began the first tentative experiments with managing naturally ignited fires deep in the park wilderness.

Saguaro National Monument (now Saguaro National Park, Arizona) was the next park to initiate a wilderness fire program, in 1971. The program required that all natural fires be extinguished except those that occurred during the monsoon season between 1 July and 15 September and that met a set of prescribed conditions (Gunzel 1974). Yosemite National Park started its “Natural Fire Management” program in 1972 (van Wageningen 1978). The first test of the program came in 1974 when the Starr King Fire burned over 1,500 ha (3,700 ac) and had to be controlled on one side to

prevent smoke from drifting into Yosemite Valley. At the same time as the Starr King Fire was burning in Yosemite, Grand Teton National Park (Wyoming) was contending with the equally large Waterfall Canyon Fire. Considerable public outcry occurred when smoke obscured the mountains, and some accused the park of having a “scorched earth” policy (Kilgore 1975). Although these early programs did not occur in congressionally designated wilderness, the term “wilderness fire” was used informally by the Service for naturally ignited fires in large remote areas of the parks.

Reevaluation years, 1978–1989

Two events in 1978 and 1988 precipitated major fire reviews. The Ouzel Fire was ignited in Rocky Mountain National Park (Colorado) by lightning on 19 August 1978 and allowed to burn as part of the park’s “prescribed natural fire” program. The fire was monitored for more than a month before high winds caused it to threaten a community outside the park’s boundary. After the fire was controlled, a board of review concluded that the fire plan was not properly implemented, did not adequately incorporate ecological information about the park, and did not put enough emphasis on external considerations such as adjoining development (Laven 1979). The Rocky Mountain National Park–prescribed natural fire program was suspended pending revision of the plan.

Ten years later, the fires of 1988 burned 562,310 ha (1,389,500 ac) in the greater Yellowstone area. Based on a wildland fire plan written in 1972, Yellowstone National Park allowed several lightning-ignited fires to burn in a remote corner of the park in late June. At the same time, U.S. Forest Service fire managers were monitoring another lightning ignition just north of the park. By the end of July, unusually dry conditions coupled with high winds persuaded managers of both agencies to suppress all fires that were currently burning, as well as all new starts (Schullery 1989). Ultimately, nine major fires accounted for 95% of the area burned in 1988 in the greater Yellowstone area. Six of those fires were ignited outside the park, and four of them were human-caused. The Secretaries of Agriculture and the Interior convened a fire policy review team to evaluate the National Park Service and U.S. Forest Service wilderness fire policies. The team reaffirmed the fundamental importance of fire’s natural role but recommended that fire management plans be strengthened by establishing clear decision criteria and accountability, and that interagency cooperation be improved (Rothman 2007).

Maturation years, 1989–1999

All federal fire programs were affected by the Bureau of Land Management’s 1994 South Canyon Fire in Colorado. Suppression action was taken on the lightning-ignited wildfire within two days of ignition, but a blowup two days later killed 14 firefighters. An interagency investigation team was formed and issued their report in August 1994. They cited several direct and contributory causes of the fatalities, including fire behavior and incident management procedures (Rosenkrance et al. 1994).

The incident led to the first comprehensive review and update of federal wildland fire policy in decades. The report reiterated that the first priority of all federal wildland fire programs was firefighter and public safety (Philpot et al. 1995). With regard to prescribed fires and prescribed natural fires, including those in wilderness, the report stated, “Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role.” In 1998 the agencies convened a task group to write a policy implementation guide for moving the policies into action. This guide used the term “wildland fire use” to refer to wildland fires used to achieve resource benefits, previously labeled “prescribed natural fires.” By the end of the decade, the 1995 policy and 1998 implementation guide reinvigorated languishing “wildland fire use” programs and gave managers the support they needed to enable the programs to continue to grow and mature.

Cerro Grande and beyond, 2000–2010

A prescribed fire set by fire managers on the Bandelier National Monument (New Mexico) in 2000 was declared a wildfire, and a backfire that the incident management team ignited escaped onto the adjacent national forest. The fire extended into the Los Alamos National Laboratory and the town of Los Alamos. Over 19,400 ha (48,000 ac) were burned and 255 homes destroyed before it was extinguished. As a result, the Secretaries of Agriculture and Interior reconvened the interagency federal wildland fire policy review working group to review the status of the implementation of the 1995 policy. The group found that the policy was generally sound and continued to provide a solid foundation for wildland fire management activities (Douglas et al. 2001) in and out of wilderness. The guidance for the use of wildland fire remained the same as in 1995, except the following sentence was added: “Use of fire will be based on approved fire management plans and will follow specific prescriptions contained in operational plans.” The working group found that the multiple terms used to describe wildland fires were confusing, but were silent on the terminology they preferred.

As a result of the 2001 policy recommendations, an interagency team revised the 1998 wildland fire use implementation guide based on the 1995 policy (USDA and USDI 2005). The new document provided direction, guidance, and assistance for planning and implementation of wildland fire use for all federal wildland fire agencies. In order to be consistent with terminology, the National Wildland Fire Coordinating Group (2006) officially endorsed the term “wildland fire use.” The new range of appropriate management responses to a wildland fire varied from monitoring to aggressive suppression action near communities.

In 2009 the departments issued updated guidance for implementation of the federal wildland fire management policy (USDA and USDI 2009). The guidance states that wildland fires are categorized into two distinct types, wildfires and prescribed fires. Wildfires are unplanned ignitions, such as fires caused by lightning, volcanoes, or unauthorized and accidental human-caused fires. Prescribed fires are wildland fires originating from a planned ignition to meet specific objectives identified in a written and approved prescribed fire management plan. A wildfire may be concurrently managed for one or more objectives, and objectives can change as the fire spreads across the landscape. The response to wildfire will be “based on ecological, social, and legal consequences, the circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected” (USDA and USDI 2009). Wilderness fires, which at various points of the evolution of federal fire policy were also called prescribed natural fires or wildland fire use fires, no longer exist as a unique category, but can occur if the park’s approved fire management plan allows for management of wildfires to achieve resource objectives. However, wilderness continues to be the primary area where wildfires are allowed to burn. Not only is wilderness often remote, but proper management of these areas requires protection of solitude, natural ecological processes, and minimization of management actions such as wildfire suppression.

Future years

Although the National Park Service led the effort to allow lightning-ignited fires to burn under prescribed conditions, the agency has become increasingly restrictive in its approach to wildfire use in and out of wilderness areas. Smoke, threatened and endangered species, the risk posed by long-term events to nonfederal lands, and the uncertainty of potential impact should fires grow beyond expected boundaries have been major concerns. The small size of many parks and wilderness areas, and their proximity to urban areas, exacerbate these problems.

Air quality poses one of the biggest challenges for managers of wildland fire use programs. Fires may cast palls of smoke in inhabited areas and can cause air quality standards to be exceeded. Active measures, such as timing ignitions during periods of good smoke dispersion, can mitigate some of

these conditions, and steps can be taken to inform local air pollution control boards about the importance of wildland fire programs for meeting land management objectives.

Air quality poses one of the biggest challenges for managers of wildland fire use programs.

Even with these constraints, the National Park Service remains the leader among federal agencies in allowing wildland fires to burn under prescribed conditions in wilderness. These fires assist in maintaining parks in an unimpaired state, which is central to the NPS Organic Act and Wilderness Act. The ecological rationale for wilderness fire supports the continuation of the program in the future, and wilderness character objectives that discourage intervention in natural processes such as fire also support the program's existence. However, climate change, the continuing encroachment on wildlands adjacent to parks and wilderness by human development, and the conflicting societal perceptions of park purposes will need to be taken into consideration. For example, many park visitors are upset when their scenic views are obscured by smoke. Large wildernesses and parks will continue to be important for understanding the long-term role fire plays in ecosystems and how to allow fire to function as a dynamic ecological process.

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About the author

Jan W. van Wagtendonk is a Research Forester Emeritus with the U.S. Geological Survey, Western Ecological Research Center, Yosemite Field Station, El Portal, California, 95318, USA. He can be reached at (209) 379-1306 and by e-mail at jan_van_wagtendonk@usgs.gov.

Table 1. Evolution of National Park Service fire policy

Era	Years	Policy Direction	Watershed Event
Fire protection	1886–1967	Suppress fires when and where resources are available; becomes official policy following establishment of the National Park Service in 1916.	1910: Fires in Idaho and Montana, including Glacier National Park, solidify suppression as sole policy.
Experimentation	1968–1977	Fire recognized as a necessary ecological process; parks experiment with naturally ignited fires.	1963: Leopold report on wildlife management in national parks prompts National Park Service in 1968 to recognize fire as a natural ecological process.

Reevaluation	1978–1989	Prescribed natural fire program suspended in the Rocky Mountains; fire policy review team evaluates NPS and U.S. Forest Service wilderness fire policies, recommending clear decision criteria, accountability, and cooperation.	1978: Ouzel Fire threatens community adjacent to Rocky Mountain National Park. 1988: Yellowstone fires lead to review of agency fire management policies.
Maturation	1989–1999	Task group writes policy implementation guide, reinvigorating languishing wildland fire use programs and giving managers support to enable growth and development of these programs.	1994: South Canyon Fire results in 14 firefighter deaths in Colorado, prompting comprehensive review of federal wildland fire policy a year later. Fire management plans are revised under the guidelines and programs begin to be implemented.
Cerro Grande (present era)	2000–2010	Secretaries of Agriculture and the Interior reconvene policy review group, which mandates approved fire management and operational plans. Wildland Fire Coordinating Group allows broader range of management responses. In 2009, policy defines and distinguishes between “wildfire” and “prescribed fire.”	2000: Cerro Grande Fire causes massive destruction in Los Alamos, New Mexico. Other fires that year in Montana precipitate 2001 review of the 1995 federal wildland fire policy. National Park Service continues to allow wildland fires to burn for multiple objectives, but air pollution, threatened and endangered species, and proximity to urban areas are significant issues in decision-making process.

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